Highlights of the Quarterly Meeting

FEDERAL INTERAGENCY COMMITTEE ON INDOOR AIR QUALITY (CIAQ)
Wednesday, July 23, 2003

Introduction: given by Tom Kelly, EPA Co-Chair. Members and guests introduced themselves.

NIST – National Institute of Standards and Technology Update – Andy Persily

We are about to release version 2.1 of CONTAM. The primary changes include the ability to import exterior pressure and contaminant data from an exterior plume (or similar) model and improvements in the ability to model HVAC controls. It will be available for download in a couple of weeks from the NIST Multizone Modeling website at *http://www.bfrl.nist.gov/IAQanalysis/default.htm*. At this site you can also download our natural ventilation design tool, LoopDA, which we mentioned at the last meeting.

Evaluation of Displacement Ventilation and Thermally De-coupled Ventilation Systems: NIST is continuing a study for the EPA to perform an initial evaluation of the potential benefits and limitations of advanced ventilation systems including displacement ventilation (DV) and thermally de-coupled ventilation (TDV) systems in commercial buildings.

BASE Ventilation Data: NIST is continuing to analyze the ventilation data collected as part of the EPA BASE study of 100 office buildings. We are focusing on outdoor air intake rates, supply airflow rates and how building factors affect these rates.

Study of Hybrid Ventilation: With DOE and ARTI funding, we are continuing a simulation study to examine the performance of natural and hybrid ventilation systems in US office buildings. A 50 zone model of a 5-story office building has been created and trial simulations with a natural ventilation system are being performed.

HUD Projects: NIST is continuing a number of projects funded by the Healthy Homes Initiative and the Office of Policy Development and Research. They include:

- Definition of a set of residential buildings that represent the US residential housing stock.
- Modelling of indoor contaminant sources, focusing on moisture, cooking and other activities.
- Development of database of IAQ modelling inputs including source strengths, deposition rates, filter efficiencies. Developed user-friendly program called CONTAM Data Link Manager to browse and search the databases as well as transfer data to CONTAMW.
- Study of airflow & contaminant transport from attached garages in single-family residences.

IEQ Performance Metrics: NIST is continuing a project to investigate the development of metrics to quantify indoor environmental conditions, specifically what has been proposed, how metrics could be used, are we ready yet and what work needs to be done.

NIST Test House: NIST is continuing testing of its new double-wide manufactured test house on the NIST campus. We are focusing on establishing its airtightness and ventilation characteristics, and have developed a CONTAM model of the building. We will be conducting studies of mechanical ventilation, air cleaning, VOC emissions from building materials, and residential moisture issues.

ASHRAE Standard 62: The committee recommended publication of four key addenda, and the ASHRAE Board of Directors acted favorably on those recommendations. They include: 62g on separation of smoking and nonsmoking spaces, 62h on the alternative IAQ Procedure for ventilation system design, 62n on the Ventilation

Rate Procedure for determining design outdoor air intake rates, and 62x on building envelope requirements related to IAQ, such as humidity control. More information on Standard 62 will be provided during today's presentation. The ASHRAE SPC 62.2P recommended publication of this new ventilation and IAQ standard for low-rise residential buildings, and the ASHRAE Board voted to publish. This approval is subject to appeal. For more information, contact Steven Emmerich at 301-975-6459 or steven.emmerich@nist.gov.

DOE – Department of Energy Update – Terry Logee

ASHRAE Standard: The ASHRAE Board of Directors has voted to approve the new ASHRAE Residential Ventilation Standard, Standard 62.2, after several years of work on the standard under the leadership of Max Sherman at LBNL. The standard requires a range of ventilation and pollutant source control measures intended to maintain an acceptable level of IAQ at minimal cost while maintaining residential energy performance. Certain interest groups have opposed the standard and are likely to appeal the approval of the standard.

Commercial and School HVAC and IAQ: LBNL has completed an experimental evaluation of a new desk-mounted task ventilation air supply technology. During experiments performed with a thermal mannequin the technology frequently increased the effective ventilation rate at the breathing zone by more than a factor of two relative to a traditional air supply systems that results in relatively uniform ventilation throughout rooms. However, in experiments with real people, the increase in effective ventilation rate at the breathing zone has been smaller, typically about 50%. We suspect that the movement of real people leads to the reduced benefits. To the best of our knowledge these are the first studies of the ventilation efficiencies of task ventilation that used real people as subjects. The ventilation efficiency of 1.5 is still better than obtained with commercially available technologies, and higher than normally obtained from displacement ventilation when used in offices with normal ceiling heights. The subjects found that the desk mounted air supply systems were comfortable.

LBNL and BARD Co. are working on a project that will develop, test, and demonstrate a new HVAC technology for relocatable classrooms. The same technology may be used in many small manufactured offices. The goals are to produce, field-test, and evaluate an HVAC system that saves energy, provides superior ventilation, and produces less noise. Work being proposed to the California Energy Commission, with participation by NIST, would allow a major expansion of the project and also incorporate a study of the relationship of classroom ventilation rates with student absence and health outcomes. The results of the ventilation study, if funded, will be used to develop recommended changes to classroom ventilation standards and to develop a related credit in the Collaborative on High Performance Schools (CHPS) program.

LBNL has developed a test system and protocol for evaluating emerging technologies designed to measure the rates of outside airflow into HVAC systems. The performance of technologies evaluated to date have been highly mixed.

LBNL completed a laboratory and field based study to develop and demonstrate a process for selecting low-emitting materials to finish interiors of new portable classrooms. The process proved effective by correctly predicting that the concentrations of toxic and odorous volatile organic compounds (VOCs) would be low when the classrooms were ventilated at or above code-minimum requirements. The study and results are described in a recent LBNL report (LBNL-52520).

The results of a previously reported study of the effect of outside air ventilation rate on VOC concentrations in a call center are described in a new LBNL report (LBNL-52497). The efficacy of ventilation for controlling VOC concentrations was shown to vary considerably depending upon the operation of the building, the pollutant sources and the physical processes affecting the pollutants indicating the need for source control measures. This article has been accepted for publication by *Atmospheric Environment*.

Analyses of the particle concentration reductions of different filtration options, along with an analysis of the costs of filtration were completed during the prior year by LBNL and Helsinki University of Technology. A full scientific paper on this research was published in the December 2002 issue of the Indoor Air Journal. A shorter summary paper written this year was just featured on the cover of HPAC Engineering, which has a broad audience of engineers. This paper provides information that will help to guide air filter selection.

A study of the performance of smoking rooms, with information to guide design, was completed by LBNL and the California Department of Health Services. A short article on this research was featured on the cover of the most recent issue of ASHRAE Journal. A full paper is scheduled for publication in the American Industrial Hygiene Association Journal. This work was primarily supported by the U.C. Tobacco Related Disease Research Program, using DOE –supported facilities and instruments.

With support primarily from the California Energy Commission and limited DOE funding, LBNL and Davis Energy Group have nearly completed a three-year study of the use a prototype HVAC technology and VOC source control measures to simultaneously save energy and improve IAQ in classrooms. Four classrooms were constructed, sited at schools, and studied for much of a school year. Each classroom had both a standard and advanced HVAC system installed. VOC source control measures were implemented in two of four classrooms. The study is one of the first to demonstrate large energy savings and simultaneous IAQ improvements. Several related reports have been completed and others are in progress.

Health and Productivity: LBNL and the Helsinki University of Technology continued their collaboration on incorporation of health and productivity effects in cost benefit modelling related to building design and operation. This work is part of a broader effort by a Task Force of the International Society of Indoor Air Quality and Climate (ISIAQ). Three papers have been completed for the Healthy Buildings 2003 Conference (conference delayed from July to December). One paper presents a model framework. A second paper provides a best estimate of the quantitative relationship between ventilation rate and absence and uses this relationship to estimate that the absence related benefits of an economizer system far exceed the energy savings. The absence-related financial benefits provide an additional incentive for using this energy savings technology in small buildings where it is often not used. A third paper provides an estimate of the quantitative relationship between indoor temperature and work performance and uses this relationship to evaluate the value of performance improvements from night-time ventilative cooling of an office. The results indicate that this energy efficient cooling technology may prevent most temperature related productivity losses in certain climates.

LBNL and Washington State University have completed a low cost analysis of existing data from 400 elementary-grade classrooms. Higher CO_2 concentrations were found to be statistically significantly associated with increased student absence, after controlling for socio economic status, grade level, classroom type, State (WA or ID) and ethnic composition of students. Absence increased by 10% to 20% per 1000 ppm increase in CO_2 concentration. An estimated outside air flow rate, based on the CO_2 concentration, the CO_2 measurement time, and the standard classroom occupancy schedule was not, however, associated with the absence rate. A report based on this work should be available by the end of July.

With support from DOE, EPA and CEC, the Indoor Health and Productivity (IHP) web site <www.ihpcentral.org> and online bibliography received a substantial upgrade. All IHP work products are now available online. The bibliography now lists citations for 1087 papers from around the world, most with online abstracts.

Indoor VOCs and Building Material Emissions: Published data on concentrations of VOCs measured in cross-sectional studies of North American residential and office buildings conducted from 1990 to the present are reviewed in a recent LBNL report (LBNL-51715). Central tendency and upper limit concentrations were summarized and compared between new and existing residences and between existing residences and office

buildings. Historical trends suggest average indoor concentrations of some toxic air contaminants, such as 1,1,1-trichloroethane, have decreased since the 1980's. A companion report that classifies the measured VOCs with respect to non-cancer health and comfort considerations is nearing completion.

LBNL is continuing to study the emissions of toxic and odorous VOCs from structural insulated panels (SIPs) and their associated components. Examples of new SIPs other materials have been obtained and are being tested for emissions over a period of four months. The diffusion of VOCs through gypsum board panels is also being investigated.

Residential IAQ: LBNL is collaborating with NIST in a long-term study of VOC concentrations and emission rates in a new double wide manufactured house set up on the NIST campus. The Florida Solar Energy Center (FSEC) initiated an investigation of different ventilation strategies and technologies for controlling humidity in new houses in hot humid climates utilizing their new double wide manufactured house as a test laboratory. LBNL is collaborating with FSEC to study the effects of these ventilation methods on the concentrations and emission rates on indoor-generated VOCs, including formaldehyde. FSEC and LBNL, in partnership with a major manufactured house corporation, are planning a field demonstration of source control techniques for formaldehyde and other VOCs.

Professional Services: With leadership from Hal Levin, LBNL, UC Berkeley, and collaborators from around the world are developing at least four special issues of journal papers that are based on the conference papers published at the Indoor Air 2002 Conference.

LBNL continued to serve on the National Academy of Sciences Committee on Damp Indoor Spaces and Health. Completion of the committee report is anticipated later this year.

Recent Publications:

Alevantis, L.; Wagner, J.; Fisk, W.J.; Sullivan, D.P.; Faulkner, D.. (2003) Designing for Smoking Rooms. ASHRAE Journal, July 2003. LBNL-53201.

Apte, M.G.; Hodgson, A.T.; Shendell, D.G.; Dibartolomeo, D.; Hotchi, T.; Lee, S.M.; Liff, S.M.; Rainer, L.I.; Sullivan, D.P.; Fisk, W.J. Simultaneous Energy Savings and IEQ Improvements in Relocatable Classrooms. To be published in ASHRAE IAQ Applications. 2003. LBNL-52690.

Fisk,WJ; Seppänen, O.; Faulkner, D.; Huang, J.. Economizer system cost effectiveness: Accounting for the influence of ventilation rate on sick leave. In To be published in Proceedings of the Healthy Buildings 2003 Conference 2003. LBNL-53192.

Fisk, W.J.; Faulkner, D.; Palonen, J.; Seppanen, O.. Performance and Costs of Particle Air Filtration in HVAC Supply Airstreams. HPAC Engineering, July 2003. LBNL-53212.

Hodgson, A.T.; Faulkner, D.; Sullivan, D.P.; Dibartolomeo, D.L.; Russell, M.L.; Fisk, W.J.. Effect of Outside Air Ventilation Rate on Volatile Organic Compound Concentrations in a Call Center. To be published in Atmospheric Environment 2003. LBNL-52497.

Hodgson, A.T.; Levin, H.. Volatile organic compounds in indoor air: A review of concentrations measured in North America since 1990. To be submitted to Atmospheric Environment 2003. LBNL-51715.

Hodgson, A.T.; Levin, H.. Classification of measured indoor volatile organic compounds based on noncancer health and comfort considerations. to be submitted to Atmospheric Environment 2003. LBNL-53308.

Hodgson, A.T.; Shendell, D.G.; Fisk, W.J.; Apte, M.G.. Comparison of predicted and derived measures of volatile organic compounds inside four relocatable classrooms die to identified interior finish sources. LBNL-52520. 2003.

McWilliams, Jennifer. Review of airflow measurement techniques. LBNL-49747.

Mendell, M.J.; Naco, G.M.; Wilcox, T.G.; Sieber, W.K.. Environmental Risk Factors and Work-Related Lower Respiratory Symptoms in 80 Office Buildings: An Exploratory Analysis of NIOSH Data. 43630-641. 2003. LBNL-51761.

Seppänen, O.; Fisk , W.J.; Faulkner, D. Cost benefit analysis of the night-time ventilative cooling in office building. In To be published in Proceedings of the Healthy Buildings 2003 Conference 2003. LBNL-53191.

Seppännen, O.; Fisk, W.J.. A conceptual model to estimate cost effectiveness of the indoor environment improvements. In To be published in Proceedings of the Healthy Buildings 2003 Conference 2003. LBNL-53193.

Wagner, J.; Sullivan, D.P.; Faulkner, D.; Fisk, W.J.; Alevantis, L.E.; Dod, R.L.; Gundel, L.A.; Waldman, J.M.. Environmental tobacco smoke leakage from smoking rooms. To be published in American Industrial Hygiene Association Journal 2003. LBNL-51010.

CPSC – Consumer Product Safety Commission Update – Treye Thomas

The CPSC's Arts and Crafts Safety Handbook:
We've compiled a list of popular arts and crafts activities (painting, pottery, stained glass, woodworking, etc.)

- Outlined hazards (both chemical and mechanical) with alternatives (if there are any).

The final compilation will be very brief

- Most of the "indoor air quality" information will address the issue of adequate ventilation
- The handbook will also discuss the potential hazards from dust exposure.

Final version expected in approximately one year.

The CPSC's School Chemical Safety Guide:

- Prepared an outline that was reviewed by EPA and NIOSH
- Draft completed based on those comments

HUD – U.S. Department of Housing and Development Update – Ellen Taylor

Healthy Homes: Healthy Homes announced request for proposals on April 25, 2003. The proposals include $5 million for demonstration grants and $2 million for research grants. The deadline for proposals was July 10, 2003. We received 58 applications for the demonstrations grants and 25 applications for research grants. Awards for the grants are typically announced in October during Healthy Homes Month. This year we may get all the money out the door by the end of the fiscal year, September. Other news on this program is that this year we tried to put more efforts into mining grantees and to that end we have a lot more grantee products on our Web site. We also have three workgroups including one on interventions, data collection, and capacity building and trainings. The intention of the workgroups is to avoid re-inventing the wheel. Making sure that the people who have been in the program for a number of years who have developed tools can discuss those tools with newer grantees. The grantees together can identify places where HUD or other programs can direct resources to their effort. Kick-off meetings started this month. We have had two meetings so far and we will post the minutes on our Web site.

Interagency Agreements:
NIST – Andy Persily will discuss.

USDA – We have a USDA extension service. They had a satellite conference on March 25, 2003. 80 HUD offices and 200 extension offices participated in the conference. We may put a web stream on the Web site. The conference primarily focused on IPM, mold, and extension service projects.

CDC – We are working with CDC to update a housing inspection manual that has not been touched since the 1970s. There is a section on IAQ and environmental health hazards. EPA expressed interested during the meeting on commenting on this section.

USDA Forest Parks – They have a house to collect data on durability issues, where they run tests in the house. They are using the upstairs of this house to display HUD materials. This provides an opportunity for other federal agencies to also display marketing materials in the house. USDA is also considering building other house, including one possibly in LA.

EPA – Environmental Protection Agency Update – Tom Kelly

Environmental Tobacco Smoke: The Consumer Federation of America's (CFA) new media campaign "My Mom's My Hero," paid for with EPA funding, was launched by the Administrator and the Consumer Federation of America in a big press event in April. The PSA was distributed to about 5,000 TV and radio stations nationwide and is now being played. You can view the PSA on our Smoke-free Homes website www.epa.gov/smokefree.

We will have two feedback sessions on our Smoke-free Homes program:
1. An informal brownbag at the end of August (if you - our CIAQ partners - do any ETS work, please come);
2. A formal, facilitated meeting for Latino stakeholders at the end of September.

An EPA contractor is currently conducting a major, nationwide survey to establish current secondhand smoke exposure rates for children in the home and collect data on asthma. We will have results in two or three months.

IED General: EPA is in the process of completing its comprehensive 3-year grants competition process. Approximately $4M in awards are currently in the approval pipeline. First time to conduct a comprehensive competition with incremental funding over next three years.

Partnership for Clean Indoor Air: The IED Department has been involved in the Partnership for Clean Indoor Air dating back to last August when there was a World Summit on Sustainable Development in Johannesburg. Our Administrator attended with a couple of other US government representatives and she put forward two initiatives that EPA would lead as type II partnerships which are a new diplomatic and aid tool rather then using traditional bilateral agreements or convention frameworks. These partnership initiatives actually bring national governments both donor and recipient together with non-government organizations and private sector representatives to try and tackle a specific problem. In the case of the partnership that we are leading, which is the Partnership for Clean Indoor Air, what we have been asked to do is to take on the challenge of addressing the rather alarming statistic that over 2 billion people worldwide use traditional bio mass fuels for cooking and heating inside, indoors, in their homes, often in open fire burning situations. As a result, more then 2 million suffer from pre-mature deaths from respiratory disease, primarily among women and children in the developing world. While there have been efforts made over the past several decades to try and break through this barrier, we haven't made substantial success. The US stepped forward and said we would lead a partnership to try and address this issue. EPA has been working hard since August to form the partnership to try and recruit donor and recipient countries. Donors include the US, Italy, and Canada. Other countries have talked about the possibility of donating funds as well or as being members of the pilot opportunity. We formally kicked off the partnership in May in New York at the United Nations when the Commission for Sustainable Development met. If anyone is interested in learning more about that, we have a fact sheet on our Web site, www.epa.gov/iaq/images/cleanairflyer.pdf. The fact sheet explains what we are doing, what issues we are addressing and how. If any members of the CIAQ committee would like to

be involved and learn more, please contact Elissa Feldman directly.

The Design Tools For Schools Web site: Our new guidance on how to better design, construct, and renovate a school, is in the final stages of approval, and we will notify you when it becomes publicly available on the web. We expect that we will get over the last hurtles of clearance within EPA and we will release the new webpage. There will be a session at the 2003 *IAQ Tools for Schools* Symposium highlighting this new exciting tool in our *IAQ TfS* arsenal.

USDA CSREES: In 1996, the U.S. Department of Agriculture Cooperative State Research, Education and Extension Service (USDA CSREES) became a partner with IED working on the Healthy Indoor Air for America's Homes national consumer education project. This program was collaboratively developed to protect the health of the American public -- through education and understanding of IAQ issues -- by reducing the risks associated with indoor air contaminants. CSREES reaches thousands of American consumers through its network of over 9,600 local extension educators working in the nation's 3,150 urban and rural counties.

National IAQ Month: An important component of the agreement between EPA and USDA is the President proclaimed National IAQ Month (October). Numerous activities take place during this month on priority IAQ issues including radon, ETS, indoor asthma triggers, and lead. At the national level, the Radon Action Month Children's Poster Contest occurs. The contest culminates with the unveiling of the winning posters at an awards ceremony in Washington, D.C. and national distribution of the posters. Additionally, the contest provides the opportunity to raise community awareness of radon and IAQ issues at the local level.

Extension Agents: Extension agents also develop news releases and PSA's for state and local media, resulting in media stories regarding IAQ issues throughout the month. Agents also conduct IAQ trainings at daycare centers and senior citizen centers, work with Head Start programs and local health departments, and staff booths at state and local health fairs, just to give a few examples.

Cook and Woodstoves: We are starting to explore the issue of pollution from cook- and woodstoves on Tribal lands; if anyone has any information, please let us know.

Ad Council: EPA has entered into a new partnership to create another smoke-free home media campaign to protect children. The big news here is that our new partners are the well-known non-profit public service advertising agency, The Ad Council (we all know them from ads like Only You Can Prevent Forest Fires, Friends Don't Let Friends Drive Drunk, and of course our own "Goldfish" asthma campaign), and the American Legacy Foundation, which was created under the Master (Tobacco) Settlement Agreement to promote a tobacco-free country. We are just getting started and the campaign should be ready in about 9 months to a year.

During the last 3 months there have been multiple airings of a series of five 30-minute programs called "Combating Household Mold" on the Better Homes and Gardens TV network and the Do-It-Yourself TV network. IED was instrumental in the development and hosting of the series.

4th National *Indoor Air Quality TfS* Symposium: will be held October 26 - 28 in Washington DC at the Grand Hyatt hotel at Metro Center. The Web page is up with the draft agenda and registration information. Experts from around the country will be presenting on hot topics for schools. We anticipate having 400 -500 attendees including Administrators, Facility managers, teachers, nurses, Schools Board Officials from across the country.

{Visit the CIAQ Website at www.epa.gov/iaq/ciaq/index.html}

NEXT CIAQ MEETING: Wednesday, 22nd October 2003 from 1:00 to 3:30 pm at Judiciary Square.

PRESENTATION

Revision of ASHRAE Standard 62
Ventilation for Acceptable Indoor Air Quality

Andy Persily of the National Institute of Standards and Technology (NIST) showed a PowerPoint presentation on revisions of ASHRAE Standard 62. An outline of the presentation follows.

Outline

"State of the Standard"
- Addenda: approved, pending, needed
- Companion Documents: Guideline & Users Manual

Related efforts
- Smoking space design guide
- Standard 62.2

Addendum 62n: Ventilation Rate Procedure
- ASHRAE IAQ Applications

History

1973: Standard 62: Specified both minimum and recommended ventilation rates.
1981: Standard 62: "Recommended" rate category deleted. Two categories became smoking and non-smoking. Added alternate "IAQ" procedure.
1989: Standard 62: Tripled and quadrupled 1981 minimum non-smoking ventilation rates; did not distinguish between smoking and non-smoking
1991: SSPC 62: Standing Committee created in June 1991 to update Standard 62-1989. SSPC 62 works for six years revising 62-1989
1996: First Public Review Draft (62-1989R) Issued ~8500 Public Review Comments Submitted
1997: ASHRAE BOD converts 62-1989 to Continuous Maintenance (62-1989R Withdrawn)

Direction from BOD in 1997

Standard 62.1
- Code-intended document

User's Manual
- Explain rationale
- Developed under contract

Guideline (19P)
- Provide design guidance
- Developed by SSPC
- Approved Title, Purpose, Scope

Also in 1997

Committee split into 62.1 and 62.2

Standard 62.1
- Commercial & institutional spaces
- High-rise residential spaces

Standard 62.2
- Residential buildings < 3 stories
- Single family dwellings

Through 4 public reviews, voting on publication

Addenda Priorities for Standard 62

- Change to code-language document
    - Minimum requirements only
    - Delete vague and non-mandatory language
    - Goal: Code-language standard by 2000 2001 2002 2003
- Update to reflect new information
- Implement new title, purpose and scope for 62.1
    - Delete single-family residential, health care and aircraft cabins based on future ASHRAE standards
    - Address relation to new and existing buildings

Why Revise Standard 62?

- Board of Directors and Standards Committee told us to convert it into code-intended language
- ~90% of Standard 62-2001 went out for public review in 1986; we know more now
- Provide more comprehensive treatment of ventilation and IAQ
    - Acceptable IAQ depends on design, construction, installation, commissioning, operation & maintenance

Progress to Date

ASHRAE Standard 62-1999
- Incorporates addenda 62c, 62d, 62e and 62f

ASHRAE Standard 62-2001
- Incorporates 62j, 62l, 62m, 62p, 62q, 62s and 62w

62i, 62t, 62u, 62v and 62ab approved in January 2002
- Available at www.ashrae.org

62k and 62o approved in June 2002
- 62o being appealed at ANSI

62r, 62z, 62ad and 62af approved January 2003
- Available at www.ashrae.org

62g, 62h, 62n, 62x and 62ae approved in July 2003
- Appeals pending

62x and 62aa, and a few others, still in progress

Standard 62-1999
Includes These Changes to 62-1999

Addendum 62a Update Tables & references
Addendum 62c Delete thermal comfort
Addendum 62d Add caveats to scope
Addendum 62e Delete smoking note
Addendum 62f Clarify CO2

Standard 62-2001
Includes These Changes to 62-2001

Addendum 62p Combustion air
Addendum 62j Natural ventilation
Addendum 62l Start-up & construction
Addendum 62m Operations & maintenance
Addendum 62q Definitions
Addendum 62s Filtration
Addendum 62w Air stream surfaces

Standard 62-2001
Board Approved Addenda 1/17/02
Addendum 62i Enabling IAQ procedure
Addendum 62t Condensate management
Addendum 62u Ventilation system controls
Addendum 62v Ventilation air distribution
Addendum 62ab Exhaust local sources

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Standard 62-2001
Board Approved Addenda 6/27/02
Addendum 62k Application & Compliance
Addendum 62o Ventilation of smoking rooms

Download free from www.ashrae.org

Standard 62-2001
Board Approved Addenda 1/30/03
Addendum 62r Outdoor air & PM10
Addendum 62z Ozone filtration
Addendum 62ad Appendix B update
Addendum 62af Scope – new & existing

Download free from www.ashrae.org

Standard 62-2001
Board Approved Addenda 7/3/03
Addendum 62g Separate ETS areas
Addendum 62h IAQ procedure
Addendum 62n Ventilation rate procedure
Addendum 62x Building envelope
Addendum 62ae Misc. definitions, etc.

Publication pending appeal

Two Companion Documents
Guideline 19P
- Approved title, purpose and scope
- Informative, not recommendations to "compete" with Standard 62
- Public review, but not subject to ANSI

Users Manual
- Explanation and examples of standard
- Under contract to ASHRAE as Special Project
- Work statement for approval in Kansas City

Related Documents
Design guide for smoking spaces
- Being developed under contract to ASHRAE Publishing
- Approval by TC 4.3 and Publishing Council

- Monitoring committee including members of SSPC 62.1, TC 2.3, TC 2.4 and TC 4.3
  Standard 62.2
- Ventilation and IAQ for low-rise residential
- BOD approved publication 7/3/03, subject to appeal

Addedum 62n
Revised Ventilation Rate Procedure
The Heart of Standard 62
Rationale for revision and rates
Calculation method

Motivation for Revising the Ventilation Rate Procedure
- Much of existing VRP in nonmandatory language.
  - Unclear how to comply
  - What is recommended? What is required?
  - SSPC directed to produce standard in mandatory & enforceable language, for adoption by building codes
- Current VRP went out for public review in 1986; there has been new research and practical experience since that time.
- Some of rates may need adjustment based other changes to standard: O&M requirements, rates based on no smoking.
- Some believe standard results in higher ventilation rates than needed in densely occupied spaces, e.g., conference rooms. Similarly, others believe lower rates than advisable in sparsely occupied spaces.
- On the other hand, some think rates are too low.
- Requirements addressing ventilation effectiveness and system efficiency unclear and often not used.
- Requirements for intermittent occupancy unclear, misused and subject of interpretations.

Rationale for 62-1989/2001 Rates
- Chamber studies on odor acceptability
- Historical rates. Many rates simply taken from "smoking rates" from 62-1981 standard
- Judgment of the Project Committee influenced by emerging and growing IAQ problem

Rationale for Addendum 62n Rates
- Explicitly recognizes building as a source of indoor air pollutants
  - Followed lead of European standards
- Explicitly accounts for ventilation efficiency
- More studies to guide rate selection
  - Almost exclusively offices
- Rates still largely based on judgment of Project Committee

Rationale for the 62n Rates
20 cfm per person correlates with less SBS symptoms in offices
Engineering experience and research

15 cfm person satisfies about 80 % of visitors to a space in terms of body odor perception
Significant adaptation to bioeffluents, but less so to materials
5 cfm person satisfies substantial majority of adapted occupants
Field and laboratory studies

Satisfying about 80% of visitors due to “building” sources
Offices: 0.4 cfm/ft2; Kindergartens 0.5 cfm/ft2; Halls 0.7 cfm/ft2
Lowest value for office buildings, 0.03 cfm/ft2
Base rate for low-emitting buildings 0.06 cfm/ft2

The Rates Themselves

- Office building reference point
  - 5 cfm/person satisfies substantial majority of adapted occupants
  - Base rate for low-emitting buildings 0.06 cfm/ft2
  - Occupant density of 5/1000 ft2 yields 17 cfm/person
- Other space types
  - Less information for definition of RP and RB
  - Use multiples of base values
  - RP: 5, 7.5, 10, 20, 0 (building dominated) cfm/person
  - RB: 0.06, 0.12, 0.18, 0.30, 0.48 cfm/ft2

Ventilation Effectiveness

- Room air mixing
  - Concerns about ventilation air getting to occupants
  - Air distribution systems to deliver air more directly to occupants
  - Section 6.1.3.3 of 62-2001 notes that Table 2 rates assume 100% effectiveness, but no method in standard to adjust
  - Now we have Standard 129 plus field and lab experience
  - 62n contains table of default values, or do your own test
- System efficiency and multiple spaces
  - Current multiple spaces approach doesn’t account for all system types and its presentation has limited its application
  - 62n uses system efficiency to account for overall efficiency of outdoor air distribution to occupant
  - Table for most systems, full calculation for more complex situations and available for any system

CIAQ Attendees: Wednesday, 23July 2003

First	Last	Agency/Org	Phone	Email
Mike	Blanford	HUD/PATH	202-708-4370	michael_d_blanford@hud.gov
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